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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,563	04/12/2006	Lester H. Landis Jr	2004UR002	1376

7590 07/21/2009  
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EXAMINER
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JONES, HUGH M

ART UNIT	PAPER NUMBER
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2128

MAIL DATE	DELIVERY MODE
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07/21/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/575,563	<b>Applicant(s)</b> LANDIS JR ET AL.	
	<b>Examiner</b> Hugh Jones	<b>Art Unit</b> 2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/8/2007</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Claims 1-46 are pending.

#### ***Specification***

2. The disclosure is objected to because of the following informalities: The figure captions should reflect the fact that fig. 1 consists of multiple figs (fig. 1a, fig. 2a, etc.). Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 101***

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-46 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

5. Process claims 1-46 were analyzed under 35 USC 101. It is recognized that, in order to be statutory, a process claim must be 1) tied to a particular machine or apparatus, or 2) it transforms a particular article into a different state or thing. *In re Bilski*, 88 USPQ2d 1385 (2008). It is also recognized that a general purpose computer may be converted into a particular computer through the operation of software on the computer. *In re Alappat*, 31 USPQ2d 1545 (1994). However, for the instant invention, it is not clear that the process must be carried out via software operating on a computer. As such, the process is not tied to a particular machine and does not meet the *Bilski* test.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1-46 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

8. While the individual steps can be carried out without difficulty, the overall invention is not enabled for the following reason. The specification does not disclose the criteria for deciding whether to carry out the particular steps. The specification, in general, appears to merely recite the claim limitations, but does not appear to provide further direction. Consider claim 1, for example:

1. A method of evaluating a reservoir, comprising:  
providing a three dimensional reservoir framework having a plurality of cells;  
assigning one or more constant reservoir property values to some or all of the cells to provide a first three dimensional reservoir model;  
updating the first three dimensional reservoir model by populating some or all of the cells with one or more variable reservoir property values to provide a second three dimensional reservoir model; and  
updating the second three dimensional reservoir model by populating some or all of the cells with one or more reservoir property values derived from seismic data to provide a third three dimensional reservoir model.

Art Unit: 2128

Clearly a skilled artisan could carry out the steps without difficulty. But, how would the artisan know when to do one or the other?

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1-46 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: the decision as to whether the models should be updated or not and the criterion for making the decision. Consider claim 1, for example:

1. A method of evaluating a reservoir, comprising:  
providing a three dimensional reservoir framework having a plurality of cells;  
assigning one or more constant reservoir property values to some or all of the cells to provide a first three dimensional reservoir model;  
updating the first three dimensional reservoir model by populating some or all of the cells with one or more variable reservoir property values to provide a second three dimensional reservoir model; and  
updating the second three dimensional reservoir model by populating some or all of the cells with one or more reservoir property values derived from seismic data to provide a third three dimensional reservoir model.

Claim 1 requires that the grid is always updated twice. However, the teaching in the specification discloses that the missing steps are required, as discussed earlier.

Art Unit: 2128

***Claim Interpretation***

11. It is unclear whether the invention is directed to a nested mesh, a hybrid mesh or a dual mesh, and, if the later, whether the dual meshes are connected or are independent. For this reason and for the reasons provided earlier, the state of the claims in the instant application precludes a limitation-by-limitation assessment of the claimed invention compared to the prior art. The Examiner cannot interpret the meanings of the claims without relying on considerable speculation. See *In re Steele*, 305 F.2d 859, 134 USPQ 292 (CCPA 1962). However, in the interests of compact prosecution, an art rejection is applied.

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Art Unit: 2128

14. Claims 1-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vasco in view of the taking of official notice.

15. Vasco discloses the fundamental teaching, but does not appear to expressly disclose all particular combinations as recited in the claims. However, it appears that the particular combinations depend upon the intended use/problem to be solved, including, for example, fracture layer thickness. See:

**Title** Integrating Dynamic Data Into High-Resolution Reservoir Models Using Streamline-Based Analytic Sensitivity Coefficients

**Authors** Vasco, D.W., Berkeley Laboratory; Yoon, S., Datta-Gupta, A., Texas A&M University

**Source** SPE Annual Technical Conference and Exhibition, 27-30 September 1998, New Orleans, Louisiana

**Copyright** 1998, Society of Petroleum Engineers

**Language** English

**Preview Abstract**

One of the outstanding challenges in reservoir characterization is to build high resolution reservoir models that satisfy static as well as dynamic data. However, integration of dynamic data typically requires the solution of an inverse problem that can be computationally intensive and becomes practically infeasible for fine-scale reservoir models. A critical issue here is computation of sensitivity coefficients, the derivatives of dynamic production history with respect to model parameters such as permeability and porosity.

We propose a new analytic technique that has several advantages over existing approaches. First, the method utilizes an extremely efficient three-dimensional multiphase streamline simulator as a forward model. Second, the parameter sensitivities are formulated in terms of one-dimensional integrals of analytic functions along the streamlines. Thus, the computation of sensitivities for all model parameters requires only a single simulation run to construct the velocity field and generate the streamlines. The integration of dynamic data is then performed using a two-step iterative inversion that involves (i) 'lining-up' the break through times at the producing wells and then (ii) matching the production history. Our approach follows from an analogy between streamlines and ray tracing in seismology. The inverse method is analogous to seismic waveform inversion and thus, allows us to utilize efficient methods from geophysical imaging.

The feasibility of our proposed approach for large-scale field applications has been demonstrated by integrating production response directly into three dimensional reservoir models consisting of 31500 grid blocks in less than 3 hours in a Silicon Graphics without any artificial reduction of parameter space, for example, through the use of 'pilot points'. Use of 'pilot points' will allow us to substantially increase the model size without any significant increase in computation time.

P. 189

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hugh Jones whose telephone number is (571) 272-3781. The examiner can normally be reached on M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571) 272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hugh Jones/  
Primary Examiner, Art Unit 2128